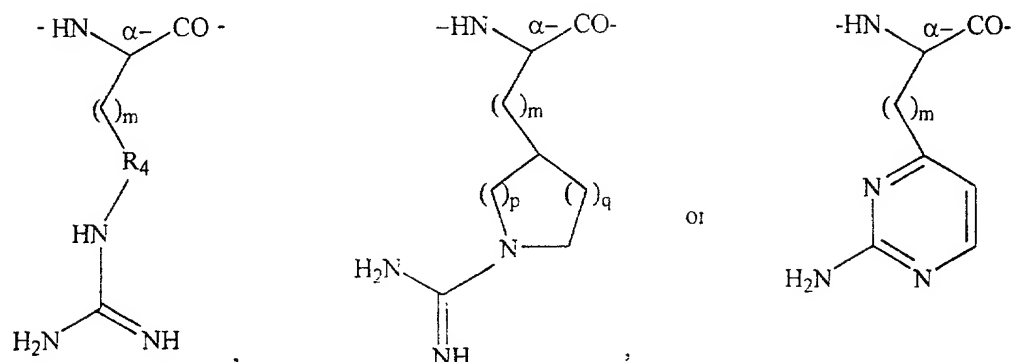


WHAT IS CLAIMED IS:

1. A peptide of structure $CM-R_3-(CA)_n-AA_1-AA_2-AA_3-AA_4-AA_5-AA_6-OH$, wherein said peptide has a selective affinity for neurotensin receptors and wherein
 CM is a chelating moiety or metal binding site:
 R_3 is D-lysine, D-phenylalanine, any D-amino acid, glycine-glycine-glycine, Gly-Ser-Gly, Tyr-Glu-Asn, DTyr-Glu-Asn, Phe-Glu-Asn, DPhe-Glu-Asn, piperidinyl glycine, aminomethylcyclohexylalanine, amino acid containing a cycloalkyl ring at the α - or β -position with an amine group or an alkyl amino substituent either externally or as a part of the ring, or a spacer unit;
 CA is a cyclic amino acid selected from the group consisting of proline, hydroxyproline, 4-oxo-proline, pipercolic acid, azetidinecarboxylic acid, and other amino acid containing a cycloalkyl ring at the α - or β -position with an amine group or an alkyl amino substituent either externally or as a part of the ring;
 $n = 0, 1$ or 2 ;
 AA_1 is an amino acid which comprises a guanidino group and wherein the α -carbon is either L- or D-, with the proviso that AA_1 is not arginine;
 AA_2 is arginine, lysine, piperidinylglycine, or other amino acid containing a cycloalkyl ring at the α - or β -position with an amine group or alkyl amino substituent either externally or as a part of the ring, wherein the amino acid can have the L- or D-configuration at the α -carbon, or AA_2 is an amino acid which comprises a guanidino group wherein the α -carbon is either L- or D-;
 AA_3 is a cyclic amino acid selected from proline, hydroxyproline, 4-oxo-proline, pipercolic acid, azetidinecarboxylic acid, or other amino acid containing a cycloalkyl ring at the α - or β -position with an amine group or alkyl amino substituent either externally or as a part of the ring, wherein the amino acid can have the L- or D-configuration at the α -carbon;
 AA_4 is phenylalanine, tyrosine, an isomer of tyrosine, polyhydroxylated phenylalanine, or other aromatic amino acid, wherein the amino acid can have the L- or D-configuration at the α -carbon;
 AA_5 is isoleucine; and
 AA_6 is leucine.

2. The peptide of claim 1 wherein AA₁ is



wherein

$m = 0-6$;

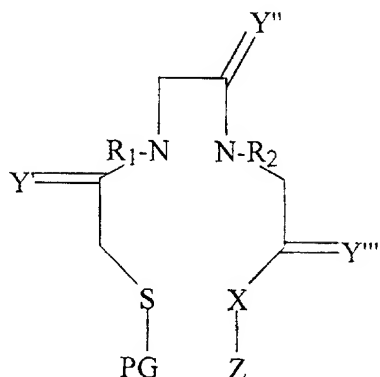
$p = 1-7$;

$q = 1-7$; and

R_4 is cycloalkyl C_3-C_{10} , phenyl, aralkyl, substituted phenyl or substituted aralkyl comprising an electron withdrawing or electron donating group with the proviso that said guanidino group is at a position different from said electron withdrawing or electron donating group.

3. The peptide of claim 1 wherein said peptide is labeled with a radioisotope.
4. The peptide of claim 3 wherein said label is ^{99m}Tc , ^{203}Pb , ^{67}Ga , ^{111}In , ^{97}Ru , ^{62}Cu , ^{64}Cu , ^{186}Re , ^{188}Re , ^{90}Y , ^{121}Sn , ^{161}Tb , ^{153}Sm , ^{166}Ho , ^{105}Rh , ^{177}Lu or a radioactive halogen isotope.
5. The peptide of claim 4 wherein if said label is a metal then CM is a chelating group for said metal and if said label is a halogen then said halogen is bound to an aromatic ring.
6. The peptide of claim 1 wherein CM is ethylene diamine tetraacetic acid (EDTA), diethylene triamine pentaacetic acid (DTPA), cyclohexyl 1,2-diamine tetraacetic acid (CDTA), ethyleneglycol-O,O'-bis(2-aminoethyl)-N,N,N',N'-diacetic acid (HBED), triethylene tetraamine hexaacetic acid (TTHA), 1,4,7,10-tetraazacyclododecane-N,N',N'',N'''-tetraacetic acid (DOTA), 1,4,7-triazacyclononane-N,N',N''-triacetic acid

(NOTA), 1,4,8,11-tetraazacyclotetradecane- N,N',N'',N''' -tetraacetic acid (TETA) or a compound of formula



wherein

PG is a sulfur protecting group selected from the group consisting of alkanoyl, arylcarbonyl, arylalkanoyl, acetamidomethyl, tetrahydropyranyl and tetrahydrofuranyl;

Y, Y'', and Y''' are hydrogen or oxygen with the proviso that at least one of them is an O;

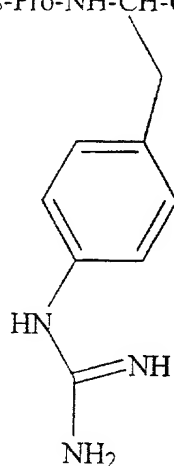
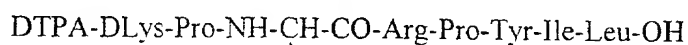
R₁ and R₂ are hydrogen or alkyl (C₁-C₃);

X = NH or S with the proviso that Y''' is hydrogen when X is S;

Z is PG if X is S; and

Z is hydroxyalkyl, aminoalkyl or carboxyalkyl.

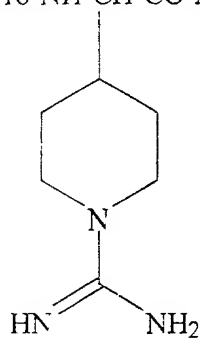
7. The peptide of claim 1 wherein said peptide is



I

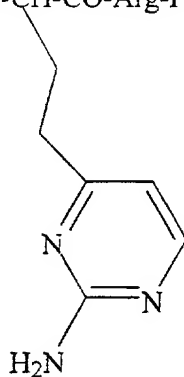
28

DTPA-DLys-Pro-NH-CH-CO-Arg-Pro-Tyr-Ile-Leu-OH



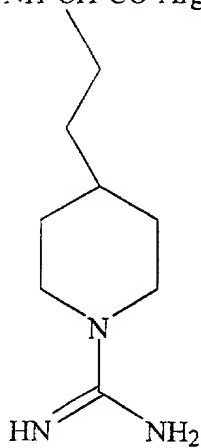
II

DTPA-DLys-Pro-NH-CH-CO-Arg-Pro-Tyr-Ile-Leu-OH



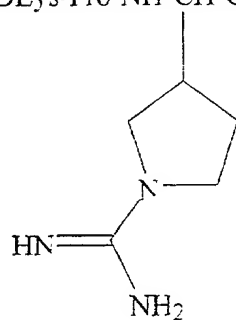
III

DTPA-DLys-Pro-NH-CH-CO-Arg-Pro-Tyr-Ile-Leu-OH



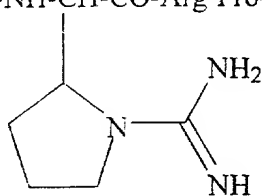
IV

DTPA-DLys-Pro-NH-CH-CO-Arg-Pro-Tyr-Ile-Leu-OH



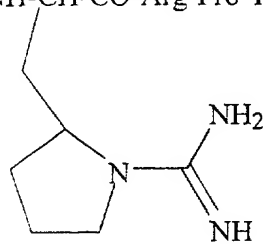
V

DTPA-DLys-Pro-NH-CH-CO-Arg-Pro-Tyr-Ile-Leu-OH



VI

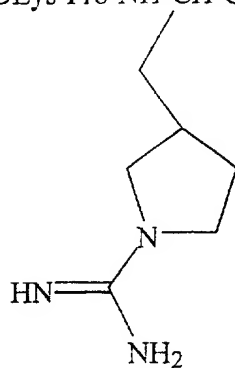
DTPA-DLys-Pro-NH-CH-CO-Arg-Pro-Tyr-Ile-Leu-OH



VII

, or

DTPA-DLys-Pro-NH-CH-CO-Arg-Pro-Tyr-Ile-Leu-OH

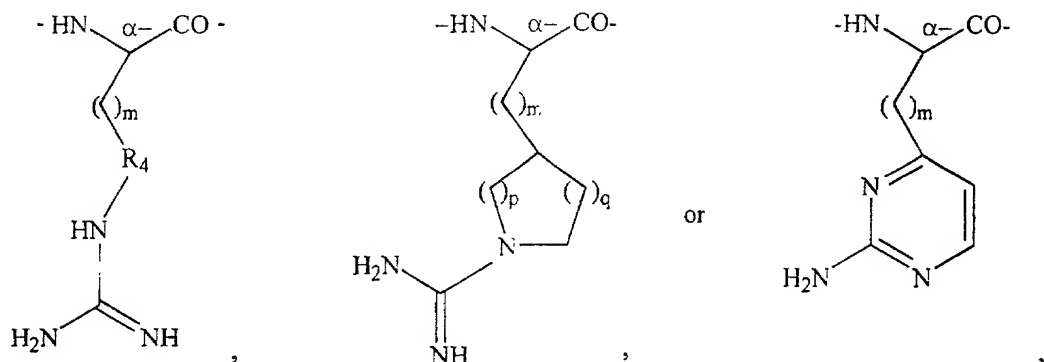


VIII

8. A peptide of structure $CM-R_3-(CA)_n-AA_1-AA_2-AA_3-AA_4-AA_5-AA_6-OH$, wherein said peptide has a selective affinity for neurotensin receptors and wherein
- CM is a chelating moiety or metal binding site;
- R_3 is D-lysine, D-phenylalanine, any D-amino acid, glycine-glycine-glycine, Gly-Ser-Gly, Tyr-Glu-Asn, DTyr-Glu-Asn, Phe-Glu-Asn, DPhe-Glu-Asn, piperidinyl glycine, aminomethylcyclohexylalanine, other amino acid containing a cycloalkyl ring at the α - or β -position with an amine group or an alkyl amino substituent either externally or as a part of the ring, or a spacer unit;
- CA is a cyclic amino acid selected from the group consisting of proline, hydroxyproline, 4-oxo-proline, pipecolic acid, azetidinecarboxylic acid, other amino acid containing a cycloalkyl ring at the α - or β -position with an amine group or an alkyl amino substituent either externally or as a part of the ring;
- $n = 0, 1$ or 2 ;
- AA_1 is an amino acid which comprises a guanidino group and wherein the α -carbon is either L- or D-, with the proviso that AA_1 is not arginine;
- AA_2 is arginine, lysine, piperidinylglycine, or other amino acid containing a cycloalkyl ring at the α - or β -position with an amine group or alkyl amino substituent either externally or as a part of the ring, wherein the amino acid can have the L- or D-configuration at the α -carbon, or AA_2 is an amino acid which comprises a guanidino group wherein the α -carbon is either L- or D-;
- AA_3 is proline, hydroxyproline, 4-oxo-proline, pipecolic acid, azetidinecarboxylic acid, or other amino acid containing a cycloalkyl ring at the α - or β -position with an amine group or alkyl amino substituent either externally or as a part of the ring, wherein the amino acid can have the L- or D-configuration at the α -carbon;
- AA_4 is phenylalanine, tyrosine, an isomer of tyrosine, polyhydroxylated phenylalanine, or other aromatic amino acid wherein said amino acid can have the L- or D-configuration at the α -carbon;
- AA_5 is t-butylglycine, 1-aminocyclohexylcarboxylic acid, cyclohexylglycine, trimethylsilylalanine, isoleucine, or other amino acid containing a branched or cyclic hydrocarbon substituent at the side chain at the α - or β -position, wherein the amino acid can have the L- or D-configuration at the α -carbon; and

AA_i is cyclopropylalanine, cyclohexylalanine, t-butylalanine, leucine, or other amino acid containing a branched or cyclic hydrocarbon substituent at the side chain at the α - or β -position, wherein the amino acid can have the L- or D-configuration at the α -carbon.

9. The peptide of claim 8 wherein AA_i is



$m = 0-6$;

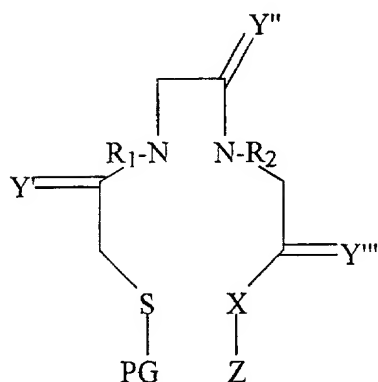
$p = 1-7$;

$q = 1-7$; and

R₄ is cycloalkyl C₃-C₁₀, phenyl, aralkyl, substituted phenyl or substituted aralkyl comprising an electron withdrawing or electron donating group with the proviso that said guanidino group is at a position different from said electron withdrawing or electron donating group.

10. The peptide of claim 8 wherein said peptide is labeled with a radioisotope.
11. The peptide of claim 10 wherein said label is ^{99m}Tc, ²⁰³Pb, ⁶⁷Ga, ¹¹¹In, ⁹⁷Ru, ⁶²Cu, ⁶⁴Cu, ¹⁸⁶Re, ¹⁸⁸Re, ⁹⁰Y, ¹²¹Sn, ¹⁶¹Tb, ¹⁵³Sm, ¹⁶⁶Ho, ¹⁰⁵Rh, ¹⁷⁷Lu or a radioactive halogen isotope.
12. The peptide of claim 11 wherein if said label is a metal then CM is a chelating group for said metal and if said label is a halogen then said halogen is bound to an aromatic ring.
13. The peptide of claim 8 wherein CM is ethylene diamine tetraacetic acid (EDTA), diethylene triamine pentaacetic acid (DTPA), cyclohexyl 1,2-diamine tetraacetic acid

(CDTA), ethyleneglycol-O,O'-bis(2-aminoethyl)-N,N,N',N'-diacetic acid (HBED), triethylene tetraamine hexaacetic acid (TTHA), 1,4,7,10-tetraazacyclododecane-N,N',N'',N'''-tetraacetic acid (DOTA), 1,4,7-triazacyclononane-N,N',N''-triacetic acid (NOTA), 1,4,8,11-tetraazacyclotetradecane-N,N',N'',N'''-tetraacetic acid (TETA) or a compound of formula



wherein

PG is a sulfur protecting group selected from the group consisting of alkanoyl, arylcarbonyl, arylalkanoyl, acetamidomethyl, tetrahydropyranyl and tetrahydrofuranyl;

Y', Y'', and Y''' are hydrogen or oxygen with the proviso that at least one of them is an O;

R₁ and R₂ are hydrogen or alkyl (C₁-C₃);

X = NH or S with the proviso that Y''' is hydrogen when X is S;

Z is PG if X is S, and

Z is hydroxyalkyl, aminoalkyl or carboxyalkyl.

14. The peptide of claim 8 wherein said peptide is
 - DTPA-Arg-Arg-Pro-Tyr-Ile-Leu-OH (SEQ ID NO:3),
 - DTPA-DLys-Pro-Arg-(4-Gu)Phe-Pro-Tyr-Ile-Leu-OH,
 - DTPA-DLys-Pro-(4-Gu)Phe-Arg-Pro-Tyr-Ile-Leu-OH (Compound I),
 - DTPA-DLys-Pro-(4-Gu)Phe-(4-Gu)Phe-Pro-Tyr-Ile-Leu-OH,
 - DTPA-DLys-Pro-Arg-Aba(Apy)-Pro-Tyr-Ile-Leu-OH,
 - DTPA-DLys-Pro-Aba(Apy)-Arg-Pro-Tyr-Ile-Leu-OH,
 - DTPA-DLys-Pro-Aba(Apy)-Aba(Apy)-Pro-Tyr-Ile-Leu-OH,
 - DTPA-DLys-Pro-(4-Gu)Phe-Arg-Pro-Tyr-tBuGly-Leu-OH (Compound IX),

DTPA-DLys-Pro-(4-Gu)Phe-Arg-Pro-Tyr-Leu(Ψ -CH₂-NH)Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-Tyr-Ile-Leu-OH (Compound II),
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-Leu-OH (Compound X),
DTPA-DLys-Pro-Gly(PipAm)-Arg-(4-oxo)Pro-Tyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-(2,6diMe)Tyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-mTyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro^R-OCO-Tyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-PipGly-Pro-Tyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-AzeCA-Tyr-tBuGly-Leu-OH,
DTPA-DLys-AzeCA-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-Tyr-Achc-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-Cpa-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-Cha-OH, -----
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-tBuAla-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-PipCA-Tyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-DPipCA-Tyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-Tyr-Chg-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-Tyr-Ile^R-OCO-Leu-OH.
DTPA-(Pip)Ala-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-Leu-OH (SEQ ID NO:6),
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-DTyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-Ala(PipAm)-Arg-Pro-Tyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-homoAla(PipAm)-Arg-Pro-Tyr-tBuGly-Leu-OH,
DTPA-DLys-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-Leu-HA,
DTPA-PipGly-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-Leu-OH (Compound XI) (SEQ ID NO:4),
DTPA-*trans*-Cha(4-CH₂NH₂)-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-Leu-OH
(Compound XII) (SEQ ID NO:5),
DTPA-DTyr-Glu-Asn-Lys-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-Leu-OH (Compound XIII),
DTPA-DTyr-Glu-Asn-Lys-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-Cha-OH (Compound XIV). or

DTPA-DTyr-Glu-Asn-Lys-Pro-Gly(PipAm)-Arg-Pro-Tyr-tBuGly-tBuAla-OH
(Compound XV).

15. A method for diagnosing a patient for a tumor by administering an effective amount of a peptide of claim 1.
16. The method of claim 15 wherein said tumor is a small cell lung carcinoma, exocrine pancreatic cancer, Ewing sarcoma, meningioma, medulloblastoma, or astrocytoma.
17. A method for diagnosing a patient for a tumor by administering an effective amount of a peptide of claim 8.
18. The method of claim 17 wherein said tumor is a small cell lung carcinoma, exocrine pancreatic cancer, Ewing sarcoma, meningioma, medulloblastoma, or astrocytoma.
19. A method for treating a patient for a tumor by administering an effective amount of a peptide of claim 1.
20. The method of claim 19 wherein said tumor is a small cell lung carcinoma, exocrine pancreatic cancer, Ewing sarcoma, meningioma, medulloblastoma, or astrocytoma.
21. A method for treating a patient for a tumor by administering an effective amount of a peptide of claim 8.
22. The method of claim 21 wherein said tumor is a small cell lung carcinoma, exocrine pancreatic cancer, Ewing sarcoma, meningioma, medulloblastoma, or astrocytoma.